

April 17, 1974

State of
Washington
Department
of Ecology



Memo to: Clar Pratt, Russ Taylor

From: Allen Moore

Subject: Efficiency Study at Cashmere ~~STP~~ LAGOON

A routine efficiency study was conducted at the Cashmere STP on March 14, 1974. Because there was no headworks, influent composite samples were taken at both the main city lift station and the Tree Top lift station. Using proportional flow rates the two composites were mixed together for a total influent composite. Also composites were taken at the flow between Cell #1 and #2 and at the final effluent. Cell #3 is used only during the summer when high evaporation results in no discharge. There is no comminutor and the sand filter beds are not used. Tree Top, the only industrial contribution accounted for a BOD load approximately 9 times that of the city during the survey. At times their influent looked and smelled like pure apple juice. The chlorination rate was increased at 1200 and was reflected in increased chlorine residual and decreased bacteria counts. Altogether, the plant looked neat and well run.

AM:jmh

STP Survey Report Form

Efficiency Study

City Cashmere Plant Type Lagoon Pop. Served 2000 Design 5000
 Receiving Water Wenatchee River Perennial xx Intermittent _____
 Date 3-14-74 Survey Period 1015-1545 Survey Personnel Moore, Jeane
 Comp. Sampling Frequency Hourly Sampling Alequot = MGD x 1000ml
 Weather Conditions (24 hr) Sunny-cool Are facilities provided for complete by-
 pass of raw sewage? xx Yes _____ No/Frequency of bypass Never
 Reason for bypass _____ --- Is bypass chlorinated? _____ Yes xx No
 Was DOE Notified? _____ --- Discharge - Intermittent _____ Continuous xx

Plant Operation

Total flow 5 1/2 hours City 67,000 Gal Tree Top 25,300 Gal How measured Totalizer
 Maximum flow .317 MGD - .115 MGD Time of Max. City 1200 hours Tree Top 1015 hours
 Minimum flow .230 MGD - .060 MGD Time of Min. 1315 hours 1100 hours
 Pre Cl₂ No #/day Post Cl₂ 34.25 #/day

Field Results

Determinations	Influent				Effluent					
	TT	Max. CITY	Min. CITY	Mean TT	Median CITY	TT	Max.	Min.	Mean	Median
Temp °C	28	13.0	12.5	18	13.0	25	7.3	5.6		5.8
pH (Units)	8.3	8.1	7.8	7.4	8.0	7.7	8.1	7.8		8.0
Conductivity (µmhos/cm ²)		---	---	24.5	---		---	---		---
Settleable Solids (mls/l)	28	7.5	7.0	21	7.25	24.5	Trace	T	T	T

Laboratory Results on Composites

Laboratory No.	Influent			Effluent		Final % Reduction Eff.
	CITY 74-784	TT -785	Combined -786	Primary -787	Lagoon 788	
5-Day BOD ppm	160	3800	1300	60	50	96% est
COD ppm	296	5580	1880	219	196	90%
T.S. ppm	784	4436	2029	696	646	68%
T.N.V.S. ppm	424	505	455	407	386	15%
T.S.S. ppm	292	581	429	215	150	65%
N.V.S.S. ppm	99	239	136	ND	ND	100%
pH (Units)	8.0	7.9	7.8	7.6	8.3	
Conductivity (µmhos/cm ²)	1020	700	910	980	920	
Turbidity (JTU's)	81	190	100	30	21	

Laboratory Bacteriological Results

Lab No.	Sampling Time	Colonies/100 ml (MF)			Cl ₂ Residual 3 min.
		Total Coliform	Fecal Coliform	Fecal Strep	
74-789	1015	40 est	<10		.4
-790	1115	120 est	<10		.4
-791	1330	<20	<10		1.0
-792	1500	<20	<10		.75
-793	1600	<20	<10		.75

Additional Laboratory Results

NO ₃ -N ppm	-	.17	
NO ₂ -N ppm	-	.03	
NH ₃ -N ppm	-	1.3	
T. Kjeldahl-N ppm	-	10.2	
O-PO ₄ -P ppm	-	2.90	
T-PO ₄ -P ppm	-	7.00	

Operator's Name Tom Davies Phone No. _____

Furnish a flow diagram with sequence and relative size and points of chlorination.

Type of Collection System

Combined Separate Both

Estimate flow contributed by surface or ground water (infiltration)

Unknown MGD

Plant Loading Information

Annual average daily flow rate (mgd)

Peak flow rate (mgd)

Dry .313 MGD

Dry .216 MGD

Wet _____

Wet .442 MGD

COMMENTS: Increased rate in chlorination at 1200 is reflected by reduced bacteria counts and increased chlorine residual.

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
**SEWAGE TREATMENT PLANT OPERATION AND MAINTENANCE
PRACTICES QUESTIONNAIRE**

FORM APPROVED
BUDGET BUREAU NO. 42-R1527

CHECK ONE <input type="checkbox"/> 1ST AUDIT <input type="checkbox"/> RE-AUDIT	DATE OF AUDIT	PLANT DESCRIPTION CODE (For Official Use Only)
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A. GENERAL INFORMATION

1. PROJECT (State, Number)	SCOPE OF PROJECT (new plant, additions, etc.)
2. PLANT LOCATION (City, county) CASHMERE, CHELAN	IDENTIFICATION OF AREAS SERVED TOWN OF CASHMERE

3. POPULATION

3A. FRACTION OF AREA POPULATION SERVED (%) 99%	3B. PLANT DESIGN (population equivalent) 50000	3C. SERVED BY PLANT (domestic) 823 METERS APPROX 20000 PEOPLE
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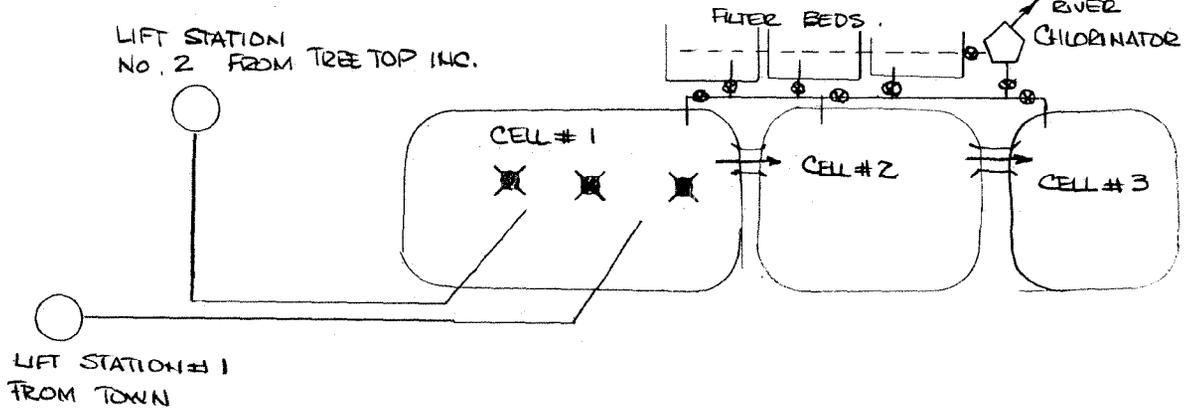
4. TYPE OF COLLECTION SYSTEM

4A. <input type="checkbox"/> COMBINED <input type="checkbox"/> SEPARATE <input checked="" type="checkbox"/> BOTH	4B. ESTIMATED FLOW CONTRIBUTED BY SURFACE OR GROUND WATER (infiltration, mgd) UNKNOWN
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5. YEAR COMMUNITY BEGAN SEWAGE TREATMENT 1961	6. YEAR PRESENT SYSTEM PLACED IN OPERATION		
	6A. SEWER 1961-1972 IMPROVED	6B. PLANT 1961-1972 IMPROVED	6C. ANCILLARY WORKS

7A. SIZE OF PLANT SITE (acres) APPROX 16 ACRES.	7B. APPROXIMATE AREA LEFT FOR EXPANSION (acres) APPROX. ONE ACRE
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6A. IN THE SPACE PROVIDED BELOW FURNISH A SIMPLIFIED FLOW DIAGRAM OR A WRITTEN DESCRIPTION OF THE PLANT UNITS IN FLOW SEQUENCE. INCLUDE THE METHOD OF ULTIMATE SLUDGE DISPOSAL. SHOW APPROXIMATE SURFACE AREA OF STABILIZATION PONDS AND NUMBER OF CELLS. INDICATE WHETHER FLOW TO AND FROM PLANT IS BY PUMPING OR GRAVITY.



8B. NOTE ANY SIGNIFICANT OR UNIQUE PROCESSING CONDITIONS.
MOST EFFLUENT IS TAKEN FROM CELL #2 TO REMOVE AS MUCH AS 'SET. SOLIDS'.

9. RECEIVING STREAM

9A. NAME OF STREAM WENATCHEE RIVER			
9B. STREAM FLOW IS <input checked="" type="checkbox"/> PERENNIAL <input type="checkbox"/> INTERMITTENT <input checked="" type="checkbox"/> NATURAL <input type="checkbox"/> REGULATED		<input type="checkbox"/> INTERSTATE <input checked="" type="checkbox"/> INTRASTATE <input type="checkbox"/> COASTAL	

B. CURRENT PERFORMANCE AND PLANT LOADING INFORMATION

1A. ANNUAL AVERAGE DAILY FLOW RATE (mgd) .313 MGD	1B. PEAK FLOW RATE (mgd) DRY WEATHER .216 MGD WET WEATHER .442 MGD	1C. MINIMUM FLOW RATE (mgd) .216 MGD
2. AVERAGE BOD OF RAW SEWAGE (5 DAY 20°C) (ppm) 188 PPM FOR TOWN / 1870 PPM FOR TREE TOP INC.	3. AVERAGE SETTLEABLE SOLIDS OF RAW SEWAGE (5 DAY 20°C) (mg/l) 2.5 ML/L FOR TOWN / 8.5 FOR TREE TOP INC.	
4. AVERAGE SUSPENDED SOLIDS OF RAW SEWAGE (mg/l) NOT ANALYSED	5. AVERAGE COLIFORM DENSITY OF RAW SEWAGE (mpn/100 ml) NOT ANALYSED	

6. ANNUAL AVERAGE PLANT REDUCTION %

6A. BOD (%) AVG. 98% REMOVAL	6B. SETTLEABLE SOLIDS (%) 99% REMOVAL	6C. SUSPENDED SOLIDS (%) NOT ANALYSED	6D. COLIFORM DENSITY (%) NOT ANALYSED
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7A. DOES PLANT HAVE STANDBY POWER GENERATOR FOR MAJOR PUMPING FACILITIES? YES NO

8. ARE CHLORINATION FACILITIES PROVIDED? YES NO
IF YES, ANSWER 8A THRU G

7B. ADEQUATE ALARM SYSTEM FOR POWER OR EQUIPMENT FAILURES? YES NO

IF YES, IS CHLORINATION CONTINUOUS? YES NO
IF NO, EXPLAIN REASON FOR INTERMITTENT CHLORINATION

8A. PURPOSE OF CHLORINATION
SANITIZE EFFLUENT

8B. TYPE OF CHLORINATOR
"ADVANCE" CHLORINATOR — CONTACT TANK

8C. POINT OF APPLICATION OF CHLORINE
CONTACT TANK

8D. CAN BYPASSED SEWAGE BE CHLORINATED?
 YES NO BYPASS CHLORINATOR?

8E. AVERAGE FEED RATE OF CHLORINE (lb/day)
34.25 lb/day

8F. CHLORINE RESIDUAL IN EFFLUENT
.93 PPM AT END OF 4 MINUTES

8G. MINIMUM SUPPLY OF CHLORINE STORED ON PREMISES (lb)
(1) 150 lb CYL ON CHLORINATOR (1) 150 lb CYL ON STANDBY (2) 150 lb CYL AT CITY HALL

9. ARE FACILITIES PROVIDED FOR COMPLETE BYPASS OF RAW SEWAGE?
 YES NO IF YES, ANSWER A THRU G BELOW, ANSWER H IN EITHER CASE.

9A. FREQUENCY (times monthly)
NEVER USED

9B. AVERAGE DURATION (hours)
NEVER USED

9C. REASON FOR BYPASSING
NO REASON

9D. ESTIMATED FLOW RATE DURING BYPASS IS
 WITHIN HYDRAULIC CAPACITY OF PLANT
 BEYOND HYDRAULIC CAPACITY OF PLANT BY

9E. DOES SEWAGE OVERFLOW IN DRY WEATHER?
 YES NO

9F. TYPE OF DIVERSION STRUCTURE
PIPE BYPASS CONTACT TANK

9G. AGENCIES NOTIFIED OF BYPASS ACTION
IF EVER USE YES.

9H. DO OPERATORS HAVE OPTION TO BYPASS INDIVIDUAL PLANT UNITS? (If no, has this caused any operational problems?)
 YES NO NO

10A. ARE BACK FLOW DEVICES PROVIDED AT ALL CONNECTIONS TO CITY WATER SUPPLY? (If no, explain)
 YES NO NO CONNECTIONS.

10B. CHECK TYPE OF BACK FLOW PREVENTION DEVICE
 DOUBLE CHECK VALVE PRESSURE OPERATED PHYSICAL DISCONNECT OTHER(specify) NO CONNECTIONS.

11. USES OF TREATMENT PLANT EFFLUENT
NONE

12. USES OF RECEIVING STREAM WITHIN 10 MILES OF OUTFALL
RECREATION, POWER GENERATION. (COLUMBIA RIVER)

13. HAVE THERE BEEN ANY ODOR COMPLAINTS BEYOND THE PLANT PROPERTY? (If yes, explain)
 YES NO

14. OBSERVED APPEARANCE AND CONDITION OF EFFLUENT, RECEIVING STREAM, OR DRAINAGE WAY
OBSERVED NO DIFFERENCE IN APPEARANCE

15. STABILIZATION PONDS

A. WEEDS CUT AND VEGETATIVE GROWTH IN PONDS ELIMINATED? YES NO

B. BANKS AND DIKES MAINTAINED (erosion etc.)? YES NO

C. FENCING AND "WARNING - POLLUTED WATER" SIGNS PRESENT AND IN GOOD REPAIR? YES NO

D. FREQUENCY OF INSPECTION BY OPERATOR
DAILY

E. WATER DEPTH (feet) 4.5 HIGH 3 LOW

4 MEDIUM IN NO. 1 CELL NO 2 AND NO. 3. MAY DRY UP IN SUMMER

F. ADEQUATE CONTROL OF DEPTH? YES NO

G. SEEPAGE REPORTED? YES NO

H. ANY REPORTS OF GROUND WATER CONTAMINATION FROM POND (If yes, give details)? YES NO

I. MOSQUITO BREEDING PROBLEM? YES NO IF YES, NAME OF SPECIES IF KNOWN

J. CAN SURFACE RUN-OFF ENTER POND? YES NO SOME STORM WATER PUT IN SYSTEM

C. SUPERVISORY SERVICES

1. IS A CONSULTING ENGINEER RETAINED OR AVAILABLE FOR CONSULTATION ON OPERATING AND MAINTENANCE PROBLEMS? YES NO IF YES IS IT ON: CONTINUING BASIS OR UPON REQUEST BASIS IF CONTINUING BASIS, WHAT IS THE FREQUENCY OF VISITS:

2. DO OPERATORS AND OTHER PERSONNEL ROUTINELY ATTEND SHORT COURSES, SCHOOLS OR OTHER TRAINING ACTIVITIES? YES NO

IF YES, CITE COURSE SPONSOR AND DATE OF LAST COURSE ATTENDED WENATCHEE VALLEY COLLEGE SPONSOR TOWN OF CASHMERE, 1972 - NEXT COURSE 26 MARCH 1974. IF NO, DO YOU KNOW OF ANY COURSES AVAILABLE TO SERVE THIS AREA?

3A. ARE ALL EQUIPMENT AND PARTS OF THE PRESENT PLANT STILL IN OPERATION? YES NO (If no, explain)

B. ARE PROCESSING UNITS OPERATING AT DESIGN EFFICIENCY? YES NO (If no, explain)

4. HAVE THERE BEEN ANY DIFFICULTIES WITH THE SEWAGE TREATMENT PLANT?

A. STRUCTURAL YES NO (If yes explain)

B. MECHANICAL YES NO (If yes, explain)

C. OPERATIONAL YES NO (If yes, explain)

FILTER BEDS ARE OF VERY LIMITED USE BECAUSE OF SEALING

D. BASED ON OPERATING EXPERIENCE TO DATE WHAT IF ANY CHANGES WOULD YOU RECOMMEND TO IMPROVE OPERATION OF THE PLANT?

I SUSPECT THAT SUSPENDED SOLID REMOVAL IS NOT UP TO STANDARDS A FILTRATION SYSTEM MAY BE IN ORDER.

5. ARE OPERATING RECORDS MAINTAINED? YES NO
 (If maintained, check general items included)

REPORTED? YES NO
 TO WHOM? STATE OF WASHINGTON
 DEPT. OF GEOLOGY - DSHS, DIV. OF HEALTH

FREQUENCY	WEATHER	FLOW	SLUDGE HANDLED	CHEMICALS USED	DIGESTER	GRIT HANDLED	ELEC. USED	COST DATA	AIR USED	MAINTENANCE	OTHER
DAILY	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>	
WEEKLY							<input checked="" type="checkbox"/>				
MONTHLY											
ANNUALLY											

6. ARE LABORATORY RECORDS MAINTAINED? (check appropriate box)

NOT AT ALL DAILY WEEKLY MONTHLY ANNUALLY

IF MAINTAINED CHECK FORM OF RECORD BELOW:

LOG BOOK TABULAR SHEET SEPARATE BY OPERATION CONTROL CHARTS GRAPHS

WHAT PLANT AND/OR LABORATORY EQUIPMENT, GAGES AND METERS ARE CALIBRATED PERIODICALLY?

7. IS LABORATORY TESTING ADEQUATE FOR THE CONTROL REQUIRED FOR THIS SIZE AND TYPE OF PLANT?

YES NO (If no, explain)

WE MEET REQUIREMENTS AS SET FORTH IS "STATE OF WASHINGTON"

LABORATORY EQUIP. TEST SCHEDULE → WATER POLLUTION CONTROL PLANT MANUAL

8. INDUSTRIAL WASTES DISCHARGED TO MUNICIPAL SYSTEM:	A. NUMBER AND TYPES OF INDUSTRIES DISCHARGING TO SYSTEMS ONE TREE TOP LIQ. JUICE PLANT
B. POPULATION EQUIVALENT (BOD) OF INDUSTRIAL WASTES (pe) 2500	C. POPULATION EQUIVALENT (SS) OF INDUSTRIAL WASTES (pe) 2500
D. VOLUME OF INDUSTRIAL WASTES (mgd) .04949 MGD AVG.	E. COMPOSITION AND CHARACTERISTICS OF INDUSTRIAL WASTES FRUIT WASTE

F. MAIN DIFFICULTY EXPERIENCED WITH INDUSTRIAL WASTE (explain)

SOME DIATOMACIOUS EARTH GET TO LAGOONS WITH ITS TRAPPING CAUSING D.O. TO DROP. OVER LOADING.

G. HAVE INDUSTRIAL EFFLUENT PROBLEMS BEEN SOLVED? YES NO (If yes, how?)

9A. METHOD OR METHODS USED TO ASSESS INDUSTRIAL WASTE TREATMENT COST (check appropriate box)

NO CHARGE BY CITY PROPERTY TAX WATER USE ASSESSMENT CHARGE BASED ON FLOW
 CHARGED BASED ON BOD CHARGE BASED ON SS OTHER METHODS (describe)

COMMENT ON HOW CHARGE IS COLLECTED (fixed charge, sliding scale, etc.)

9B. IS INDUSTRIAL WASTE ORDINANCE IN EFFECT AND ENFORCED? YES NO

10. WHO PROVIDED INITIAL INSTRUCTION IN THE OPERATION OF THE PLANT?
 PACIFIC NORTH WEST WATER POLLUTION CONTROL ASSOC.

11. IS A MANUAL OF PRACTICE OR INSTRUCTIONS AVAILABLE? YES NO

IF YES, WHO WROTE AND PROVIDED IT?
 LEE JOHNSON AND ASSOC. & STATE

12. ESTIMATE OF MAN-HOURS PER WEEK DEVOTED TO LABORATORY WORK AND MAINTENANCE OF RECORDS AND REPORTS
 40 MAN HOURS

D. PLANT PERSONNEL (Annual Average Staff for Most Recent Year Reported in Section "F")

JOB CATEGORY	NUMBER	TOTAL MAN-HOURS PER WEEK	TOTAL NUMBER CERTIFIED OR LICENSED	RANGE IN YEARS EMPLOYED AT PRESENT PLANT	RANGE IN YEARS OF EXPERIENCE IN TREATMENT
1. SUPERINTENDENT					
2. OPERATORS	1	40	1	1	1
3. LABORATORY TECHNICIANS					
4. LABORERS					
5. PART-TIME LABORERS					
6. TOTAL					

E. LABORATORY CONTROL

Enter test codes opposite appropriate items. If any of the below tests are used to monitor industrial wastes place an "X" in addition to the test code.

CODES

- 1 - 7 or more per week 3 - 1, 2, or 3 per week 5 - 2 or 3 per month 7 - Quarterly 9 - Annually
 2 - 4, 5 or 6 per week 4 - as required 6 - 1 per month 8 - Semi-Annually

ITEM	RAW	PRIMARY EFFLUENT	MIXED LIQUOR	FINAL	SLUDGE		DIGESTOR	RECEIVING STREAM
					RAW	SUPER-NATANT		
1. BOD	3			3				
2. SUSPENDED SOLIDS								
3. SETTLEABLE SOLIDS	2			2				
4. SUSPENDED VOLATILE								
5. DISSOLVED OXYGEN	2			2				
6. TOTAL SOLIDS								
7. VOLATILE SOLIDS								
8. pH	2			2				
9. TEMPERATURE	2			2				
10. COLIFORM DENSITY								
11. RESIDUAL CHLORINE	2			2				
12. VOLATILE ACIDS								
13. M. B. STABILITY								
14. ALKALINITY								
15.								
16.								
17.								
18.								
19.								

F. OPERATION AND MAINTENANCE COST FOR PLANT

YEAR OF OPERATION	SALARIES/WAGES	ELECTRICITY	CHEMICALS	MAINTENANCE	OTHER ITEMS	TOTAL
MOST CURRENT YEAR 1974	7080	EST. \$4660	\$2500	\$5000		19,240
PRIOR YEAR 1973	\$8200	\$4660	\$4,000	\$1000		17,860
PRIOR YEAR 1972	\$1000	—	\$100	\$500		1600
PRIOR YEAR 1971	\$500	—	—	—		500

EVALUATION PERFORMED BY	TITLE	ORGANIZATION

INFORMATION FURNISHED BY	TITLE	ORGANIZATION	DATE
DAVID L. SIMMER	SUPT UTILITIES.	TOWN OF CASHMERE	MARCH 15 1974

G. NOTATIONS BY EVALUATOR

1. ADDITIONAL REMARKS *(If remarks refer to a particular item, identify by number)*

2. GENERAL COMMENTS ON HOUSEKEEPING AND MAINTENANCE

3. REQUIREMENTS OF HIGHER AUTHORITY

3A. DOES THE PLANT PROVIDE THE DEGREE OF TREATMENT PRESENTLY REQUIRED BY THE STATE? *(If no, explain)*

YES NO

3B. ARE THERE ANY PENDING ACTIONS *(enforcement conferences, change in water quality standards, etc.)* THAT WOULD REQUIRE UPGRADING OF TREATMENT BY THIS PLANT?

YES NO *(If yes, explain)*

3C. NUMBER OF STATE INSPECTIONS OF PRESENT PLANT TO DATE.

4. IS ANY FOLLOW-THRU ACTION REQUIRED TO (1) CORRECT DEFICIENCIES IN THE PLANT OR ITS OPERATION OR (2) RESOLVE INDUSTRIAL WASTE PROBLEMS? *(If yes, describe required corrective action)* YES NO